

## *Amaranthus* spp.

### **Amaranth**

Amaranths are plants of the genus *Amaranthus*. There are approximately 60 species, all are annuals with small seeds (approximately 0.07 grams per 100 seeds). The cultivated forms are useful for producing nutritious grain and foliage, and as colorful ornamentals (Brenner et al., 2000). The plants are tolerant of heat and drought. Pollination is by wind or insects, most species are monoecious, some are dioecious.

### **Amaranth Grain**

Forms with white seeds were cultivated in prehistory for use as a grain crop. The grain has an unusually nutritious balance of amino acids making it an excellent protein food (Segura-Nieto et al. 1994). In the United States, breakfast cereals, pastas, breads, etc. containing amaranth grain or flour are available in health food stores. In India, Mexico, Nepal, Peru, and some other countries, amaranth grain is a traditional food used as a gruel or in confectionery products. In the United States, 2,000 to 3,000 ha are in production, Nebraska is the most important state (Stallknecht and Schulz-Schaeffer 1991). The grain is also potentially useful as a source of small-grained specialty starch and as a source of squalene oil.

### **Amaranth Vegetable**

Amaranth foliage is used as a vegetable and as an animal food especially in the tropics and subtropics. It is an excellent source of bio-available iron, up to 57 ppm (Rangarajan and Kelly 1994), and vitamin A, averaging 250 ppm. It is also high in protein (Segura-Nieto et al. 1994).

### **Amaranth Ornamental**

Ornamental amaranths are very colorful. They can have markings or solid coloring of pink to dark purple-red, or orange, green, or white. The inflorescence can be drooping rope-like, erect, or inconspicuous in the leaf axils. The [Germplasm Resources Information Network](#) (GRIN) Amaranth descriptors have more information on these characteristics.

### **Amaranth Wild**

Most of the species in *Amaranthus* are wild. They include some important summer annual weeds. Herbicide-resistant forms have made control more difficult. Switching among herbicide types is recommended for control of resistant weed populations. Most of the species have not become weeds, but have limited distributions in their native areas. Many of the species are found in wetlands or semi-desert life zones. The southwest United States is especially rich in *Amaranthus* species diversity.

## The Germplasm Collection

The Amaranthus germplasm collection of the Plant Introduction Station is curated by David Brenner. It includes approximately 3,000 accessions, and half of the species in the genus (Brenner et al., 2000). Most of the accessions are landrace types for grain production. Seeds are regenerated in a greenhouse within pollination isolation tents (Brenner and Widrlechner, 1998).

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## References

Brenner, D.M., D.D. Baltensperger, P.A. Kulakow, J.W. Lehmann, R.L. Myers, M.M. Slabbert, and B.B. Sleugh. 2000. Genetic resources and breeding of Amaranthus. *Plant Breeding Reviews* 19: 227-285.

Brenner, D.M. and M.P. Widrlechner. 1998. Amaranthus seed regeneration in plastic tent in greenhouses. *FAO/IPGRI Plant Genetic Resources Newsletter* 116: 1-4.

Rangarajan, A. and J. Kelly. 1994. Iron availability from Amaranthus species. *Legacy*. 7:1-4.

Segura-Nieto, M., A.P. Barba de la Rosa, and O. Paredes-López. 1994. Biochemistry of amaranth proteins. in *Amaranth Biology, Chemistry, and Technology*. (ed.) Octavio Paredes-López, CRC Press. Boca Raton. pp. 75-106.

Stallknecht, G.E. and J.R. Schulz-Schaeffer. 1993. Amaranth rediscovered. in *New Crops*. (eds.) J. Janick and J.E. Simon. John Wiley & Sons, New York, pp. 211-221.

## Related Sites

[Amaranthus tricolor L.](#)

[Amaranthus spinosus L.](#)

[Nu-World](#)

[The world's tallest amaranth plant](#)

At right:

*Amaranthus australis*, PI 553076,  
measured 4.61 m (15.12 ft) on  
September 29, 2004.

